CHAPTER 1

1 PROJECT BACKGROUND

1.1 INTRODUCTION

Nowadays, skateboarding has moved from driveways and skate parks to city parks and streets, where it had expanded from a recreation activity to a form of personal mobility transportation (Walker & Dill, 2013). With higher demand of personal electric mobility transportation than ever, electric skateboards are gradually becoming more popular in urban transportation, which provide lots of benefits more than a regular bicycle which includes a healthy exercise, free parking, zero emissions, and freedom from gridlock. In most situations of traffic jam in the city, riding an electric skateboard will be faster and cheaper than car or public transit. Electric skateboard is a battery powered, four-wheeled of portable transport designed for individuals. It consists of a deck that attached to the wheel used to drift or skate by different type of tricks. Deck of electric skateboards can be made up from different materials such as wood, fiberglass, plexiglass, plastic and other composites.

Moreover, in urban area, parking issues had been an increasing conflicting situation for urban dwellers and it is always associated with the increased awareness of CO_2 emissions and the environmental consequences of profligate consumption of fossil fuels (McLoughlin, 2012). Electric cars have been invented to solve the environment pollution problem.

Unfortunately, electric cars are expensive and not everyone is able to afford one. Moreover, electric cars require parking spaces just like conventional vehicles, and thus will not solve parking problems (McLoughlin, 2012). Apart from that, electric cars are often a long term investment where owners have to pay insurances, maintenance, road tax payments and license payment over the years. By contrast, electric skateboard does not require insurance, attract no road tax and typically do not require a license to ride in most countries. Furthermore, they are efficient, environmentally friendly, and cheaper to buy.

Fundamentally, the electric skateboard is just a regular skateboard with an electric motor to provide additional assistance. Users can skate normally and only use the motor to help out on hills and headwinds, or use the motor all the time just to make riding easier. The electric assistance help people to save energy compare to walking or cycling. The use of electric boards is highly recommended to implement in university campus. Throughout the years, many students choose to walk for a short distance and take public transport or car along far distance buildings inside campus. Usually, students have to take at least 15-20 minutes to travel to classes around university because most campus have long distances between each building. The idea of having a portable and fast transportation, which people don't have to use physical force, came to our mind when we saw a student skating and paddling constantly because he was late for class.

The use of electric skateboard is very common among youngsters but not every normal individual was able to enjoy these electric rides, especially for users in Malaysia, because of its high price tag. However, with the current advancement and development of technology, electric skateboards are becoming more accessible for public use with lower material cost. The speed and actual capacity of an electric skateboard depends on many variables including but not limited to, the battery used to power it, lithium or lead, the size of the battery, as well as the quality and the output of the motor and drive system.

In conclusion, an electric skateboard that will offer speeds up to 32.19 km/h delivered from a powerful max 1200W hub motor, along with a lithium polymer battery that is capable of providing riders with long period of use is designed. The electric skateboard is also built 3 for carving and cruising with its concave deck shape design by using lightweight and durable material. Another highlight of this design is that a single fully charge battery will take between 3-4 hours, and there is also a portable solar charger to give user an alternative charging experience when there is no power plug near them.

1.2 PROBLEM STATEMENT

Transportation is one aspect we cannot live without in these day and age. However, the transportation systems nowadays come along with lots of problems including global warming, environment degradation, health issues (physical, emotional, mental, and spiritual) and emission of greenhouse effect. In fact, the transport sector attributes to 23% of the globe's greenhouse gas emission resulting from burning of fossil fuels. All of this puts lot of burden on the national governments to devise policies to reduce greenhouse gas emissions as well as oil demands. Green transportation revolves around efficient and effective use of resources, modification of the transport structure and making healthier travel choices (Converse Energy Future, 2017). Besides, according to World Bank's 2015 Malaysia's Economic Monitor report, the congestion cost in Malaysia had amounted to 1.1%-2.2% of Malaysia's GDP in 2014, where this sum of cost is divided into 3 types of cost, including delays, fuel, and CO_2 and other emissions (Gil Sander, Blancas Mendivil, & Westra, 2015). It is common to know that that these recent years, fuel price is increasing. Moreover, buying a car is a long term investment as we need fuel to operate. Besides, maintenance service and road tax are also high cost expenses that vehicle owners couldn't avoid. By contrast, electric skateboard only requires minimum operation and maintenance fees, no insurance fees, attract no road tax and typically do not require a license to ride in most countries. Furthermore, they are efficient, environmentally friendly, and far denser, when parked and driven, than the equivalent rows of cars. Riding an electric skateboard could also help eliminate the requirement of parking spaces, especially in urban areas where parking spaces are highly limited. Therefore, a green technology transportation is needed to develop to replace the current transportation. In our research, using a solar charging skateboard to commute is another great mode of green transportation. Skateboarding has expanded from its predominant form of recreation into a recognizable form of transportation. Solar electric skateboard is an ideal form of transportation for trips that are too far to walk. A standard electric skateboard is normally control by a radio frequency remote control and have a maximum speed up to 30 km per hour. Hence, a solar electric skateboard is developed by many strong and best material to overcome those problems. Moreover, an electric skateboard charging design is portable and it can be charging everytime it low of battery and also